I Claim:

1. A grid plate assembly for a plasma ashing machine used for photoresist removal in processing integrated circuits and micro-electro-mechanical devices at typically, but not limited to temperatures < 100°C, comprising:

an upper grid plate;

a lower grid plate;

a grid plate gap;

said upper and lower grid plates supported at perimeter so as to be separated by said gap; wherein said gap separation between said upper and lower grid plates is made variable so as to control the uniformity of neutral plasma gases flowing through said grid plate assembly.

2. The grid plate assembly of Claim 1, wherein said upper and lower grid plates are made of metal with a series of equal diameter holes; and said upper and lower grid plates are aligned so as to have no direct line-of-sight through said grid plate assembly.

3. The grid plate assembly of Claim 2 wherein said grid plate gap separation is made larger in a stepwise manner in the center portion of said grid plate assembly.

4. The grid plate assembly of Claim 3 wherein said stepwise gap separation varies in a range of 0.035 to 0.050 inches.

5. The grid plate assembly of Claim 2 wherein said grid plate gap separation continuously increases from edge-to-center of said grid plate assembly.

6. The grid plate assembly of Claim 5 wherein said stepwise gap separation varies in a range of 0.035 to 0.050 inches.

7. The grid plate assembly of Claim 4 or 6 wherein the flow rate uniformity of neutral reactive plasma particles exiting through said lower grid plate is improved by more than 50%.

8. A grid plate assembly for a plasma ashing machine used for photoresist removal in processing integrated circuits and micro-electro-mechanical devices at typically, but not limited to temperatures < 100°C, comprising:

an upper grid plate;

a lower grid plate;

a grid plate gap;

said upper and lower grid plates support at perimeter so as to be parallel to each other and separated by said gap;

said upper and lower grid plates made of metal each with a series of variable diameter holes.

9. The grid plate assembly of Claim 8 wherein said series of variable diameter holes increase in size from edge-to-center of said grid plates.

10. The grid plate assembly of Claim 9 wherein said upper and lower grid plates are aligned so as to have no direct line-of-sight through said grid plate assembly.

11. The grid plate assembly of Claim 10 wherein said gap separation between said parallel grid plates vary in a range of 0.035 to 0.050 inches.

12. The grid plate assembly of Claim 11 wherein the flow rate uniformity of neutral reactive plasma particles exiting through said lower grid plate is improved by more than 50%.

13. A plasma ashing machine for photoresist removal in the processing of integrated circuits and micro-electro-mechanical devices, comprising:

a plasma chamber;

a vacuum system connected to said plasma chamber used to control the pressure within said chamber;

a gas distribution system for supplying process gases to said plasma chamber;

a heater and temperature controller for controlling temperature within said plasma chamber;

a plasma source located inside said plasma chamber;

a RF power supply connected to said plasma source;

a process wafer; and

a grid plate assembly with variable control to neutralize and control the flow uniformity of plasma gases to said process wafer.

14. The plasma ashing machine of Claim 13, wherein said grid plate assembly further comprises:

upper and lower grid plates made of metal with a series of equal diameter holes; and

said upper and lower grid plates aligned so as to have no direct line-of-sight through said grid plate assembly.

15. The plasma ashing machine of Claim 14 wherein said variable control of flow rate uniformity method consists of a stepwise larger grid plate gap separation in the center portion of said grid plate assembly.

16. The plasma ashing machine of Claim 15 wherein said stepwise gap separation varies in a range of 0.035 to 0.050 inches.

17. The plasma ashing machine of Claim 14 wherein said variable control of flow rate uniformity method consists of a continuously larger grid plate gap separation from edge-to-center of said grid plate assembly.

18. The plasma ashing machine of Claim 17 wherein said continuous gap separation varies in a range of 0.035 to 0.050 inches.

19. The plasma ashing machine of Claim 14 wherein said variable control of flow rate uniformity method consists of parallel grid plates with constant gap separation and continuously increasing diameter holes from edge-to-center of said grid plate assembly.

20. The plasma ashing machine of Claim 19 wherein said stepwise gap separation varies in a range of 0.035 to 0.050 inches.

21. The plasma ashing machine of Claim 16, 18, or 20 wherein the edge-to-center ash rate uniformity for photoresist removal on process wafer is improved by more than 50%.